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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/028,238	12/21/2001	Mikio Oda	NEKU 19.296	3180

26304 7590 12/26/2002

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EXAMINER

STULTZ, JESSICA T

ART UNIT PAPER NUMBER

2873

DATE MAILED: 12/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/028,238

Applicant(s)

ODA ET AL.

Examiner

Jessica T Stultz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on December 5, 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 16-20 and 22-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 15, and 21 is/are rejected.
- 7) ☒ Claim(s) 13 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election of Group Ia, claims 1-15 and 21 in Paper No. 5 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The disclosure is objected to because of the following informalities: On page 22, line 5, it is unclear as to the relevance of "(111)" is, please delete or replace with correctly translated word. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 1, 3, 11, 12, and 21 (and dependent claims 2, and 4-9) are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1 and 21, the phrase “a second substrate movably provided for said first substrate” is unclear because it is vague as what the applicant is claiming as the limitation in the claim. The specification supports the limitation that “a second substrate which is movable relative to the first substrate” (this being the assumed meaning for purposes of examination).

Specifically regarding claim 3, the phrase “said driving section is a ultrasonic wave generating source is a piezo-electric device” is unclear because it is vague as what the applicant is claiming as the limitation in the claim. The specification supports the limitation that “said driving section is an ultrasonic wave generating source with a piezo-electric layer on the moving substrate” (this being the assumed meaning for purposes of examination).

Specifically regarding claim 11, it is unclear from the disclosure and figures as to what the phrase, “conductive line” is referring, rendering the claims vague and indefinite. Further clarity is required.

Regarding claim 12, it is unclear from the disclosure and figures as to what the phrase “transformed layer” is referring, rendering the claims vague and indefinite. Further clarity is required.

Claims 2 and 4-9 are rejected because they inherit the indefiniteness of the claims they depend.

Claim Objections

Claims 2 and 3 are objected to because of the following informalities: The phrase “is a ultrasonic” should be “is an ultrasonic”.

Claims 11 and 13 are objected to because of the following informalities: The phrases: “section having two mirror” should be “section has two mirror”, “wherein said tow mirror

portions” should be “wherein said two mirror portions”, and the phrase “section having two” should be “section has two”. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 4, 8, 10, 15, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokoyama et al.

Specifically in reference to claim 1, Yokoyama et al discloses an optical path control apparatus and method of switching an output optical path (Abstract, wherein the “reflector” changes the path of light, and Column 19, lines 23-24, “301C”, Figures 27, 28A, and 28B) comprising: a first substrate (Column 19, line 24, wherein the first substrate is fixed block “331”, Figures 27, 28A, and 28B); a second substrate which is movable relative to the first substrate (Column 19, line 36, wherein the second movable substrate is movable block “334”, Figures 27, 28A, and 28B); a mirror section provided on said second substrate (Column 19, lines 34-47, and column 20, line 21, wherein the mirror section is reflective surface “336S”, which is shown as being on the movable block “334”, Figures 27, 28A, and 28B); and a driving section which moves said second substrate (Column 19, lines 48-63, and Column 20, lines 24-34, wherein “334” is moved by magnets, Figures 27, 28A, and 28B) such that a first optical path of input light to said mirror section is optically connected to one of a plurality of second optical paths

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(Column 19, line 64-Column 20, line 23, wherein the first input light is either “306A or 306C” and the second optical paths are “306B or 306D”, Figures 27, 28A, and 28B).

Regarding claim 3, examiner takes judicial notice that it is well known in the art of optical path control for the driving section to be an ultrasonic wave-generating source with a piezo-electric layer on the moving substrate.

Regarding claim 4, Yokoyama et al further discloses an optical path control apparatus as is disclosed above wherein said driving means includes two electromagnets, said second substrate is a permanent magnet provided between said two electromagnets (Column 19, line 48-Column 20, line 23, wherein the permanent magnets “338U and 338L” are on the top and bottom of second substrate “334”, which acts as a permanent magnet by moving in response to attractive forces between magnets “338U “and “338L”, Figures 28A and 28B), said permanent magnet is moved between two positions based on magnetic polarities of said two electromagnets (Column 20, lines 7-13, Figures 28A and 28B), and said first optical path is optically connected to said second optical path associated with one of said positions (Column 19, line 67- Column 20, line 3 and Column 20, lines 17-20, Figures 28A and 28B).

Regarding claim 8 and 15, it is inherent that the mirror section of the optical path control apparatus of Yokoyama is a thin film mirror, this being reasonably based upon the figures portraying the mirror as a thin film mirror (Figures 27, 28A, and 28B).

Regarding claim 10, Yokoyama et al discloses an optical path control apparatus comprising (Abstract, wherein the “reflector” changes the path of light, and Column 19, lines 23-24, “301C”, Figures 27, 28A, and 28B); a substrate (Column 19, line 36, “334”, Figures 27, 28A, and 28B) and a mirror section which is provided on said substrate (Column 19, lines 34-47, and

column 20, line 21, wherein the mirror section is reflective surface “336S””, which is shown as being on the movable block “334”, Figures 27, 28A, and 28B) and changes an optical path of reflection light to input light by said mirror section in response to an input signal (Column 19, line 67- Column 20, line 3 and Column 20, lines 17-20, Figures 28A and 28B, wherein the input light would give off an input signal).

Regarding claim 21, Yokoyama et al discloses an optical path control apparatus comprising (Abstract, wherein the “reflector” changes the path of light, and Column 19, lines 23-24, “301C”, Figures 27, 28A, and 28B); a first substrate (Column 19, line 26, wherein the first substrate is fixed block “331”, Figures 27, 28A, and 28B), a second substrate movably provided for said first substrate (Column 19, line 36, wherein the second movable substrate is movable block “334”, Figures 27, 28A, and 28B); and a mirror section which is provided over said first and second substrate (Column 19, lines 27-33, wherein the mirror sections are reflective surfaces “332L and 332L’” and “336S and 336S””, which are shown as being on first substrate “331” and second substrate “334” respectively, Figures 27, 28A, and 28B) and a driving section which moves said second substrate (Column 19, lines 48-63, and Column 20, lines 24-34, wherein “334” is moved by magnets, Figures 27, 28A, and 28B) such that a first optical path of input light to said mirror section is optically connected to one of a plurality of second optical paths (Column 19, line 64-Column 20, line 23, wherein the first input light is either “306A or 306C” and the second optical paths are “306B or 306D”, Figures 27, 28A, and 28B).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoyama et al.

Regarding claim 9, Yokoyama discloses the optical path control apparatus as disclosed above, but does not specifically disclose that the mirror section is a lump type. However, it is obvious that the lump type mirror is a matter of design choice and that the shape of the mirror is determined by the type of reflection desired. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the claimed mirror be lump type so that the mirror can fit the type of reflection desired.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoyama et al in view of Hagelin et al.

Regarding claim 5, Yokoyama discloses the optical path control apparatus as disclosed above, but does not specifically disclose that the second substrate has a gear shape, and said mirror section is provided on said second substrate via a base section, said driving section has an electrostatic actuator, and rotates said second substrate based on force generated by said electrostatic actuator such that said mirror section is rotated, and said first optical path is optically connected to said second optical path associated with a rotation angle of said mirror section. Hagelin et al teaches of an optical mirror system wherein the mirror section is provided on a second substrate via a base section (Column 3, lines 8-12, wherein the base section is "101" and the mirror section is "103", Figures 1-4), said driving section has an electrostatic actuator and rotates said second substrate based on force generated by said electrostatic actuator (Column 3, lines 29-56 and Column 2, line 3-7, wherein the actuators are "302a-c and 304a-c", Figures 1-

4) such that said mirror section is rotated so that mirror can rotate in many different directions (Column 5, lines 9-12). Hagelin does not specifically disclose that the first optical path is optically connected to said second optical path associated with a rotation angle of said mirror section and that the second substrate is a gear shape. However, it is obvious that the first optical path is optically connected to said second optical path associated with a rotation angle of said mirror section and that the gear shape of the second substrate is a matter of design choice and that the shape of the mirror is determined by the type of movement of the mirror needed for the reflection desired. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the optical path control apparatus as disclosed above, but does not specifically disclose that the second substrate has a gear shape, and said mirror section is provided on said second substrate via a base section, said driving section has an electrostatic actuator, and rotates said second substrate based on force generated by said electrostatic actuator such that said mirror section is rotated, and said first optical path is optically connected to said second optical path associated with a rotation angle of said mirror section since Hagelin et al teaches of an optical mirror system wherein the mirror section is provided on a second substrate via a base section, said driving section has an electrostatic actuator, and rotates said second substrate based on force generated by said electrostatic actuator such that said mirror section is rotated so that mirror can rotate in many different directions.

Allowable Subject Matter

Claims 2 and 6-7 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 13-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: none of the prior art alone or in combination disclose or teach of the claimed combination of limitations to warrant a rejection under 35 USC 102 or 103.

Specifically regarding claim 2, none of the prior art alone or in combination disclose or teach of the claimed optical path control apparatus as is disclosed above wherein the driving means is an ultrasonic wave generating source, and specifically wherein said second substrate is moved by progressive waves generated by said ultrasonic wave generating source and is located on a position by standing waves and said first optical path is optically connected to said second optical path associated with said position.

Specifically regarding claim 6, none of the prior art alone or in combination disclose or teach of the claimed optical path control apparatus as is disclosed above specifically wherein the second substrate has a micro-light wheel, the driving section has lasers, and the second substrate rotates based on laser beams emitted by said lasers, and said first optical path is optically connected to said second optical path associated with a rotation angle of said mirror section.

Specifically regarding claim 7, none of the prior art alone or in combination disclose or teach of the claimed optical path control apparatus as is disclosed above specifically wherein the second substrate is provided a concave section of the first substrate, wherein the concave section is filled with fluid; further wherein said driving section moves the second substrate by supplying the fluid from one end of the concave section and absorbing fluid from another end of the

concave section, said mirror section reflects said input light based on the movement of the second substrate so that the first optical path is optically connected to the second optical path.

Specifically regarding claim 13, none of the prior art alone or in combination disclose or teach of the claimed optical path control apparatus as is disclosed above wherein the mirror section has two mirror portions, specifically wherein each of the portions comprises: a mirror layer provided as a surface layer; and a magnetic layer provided under said mirror layer, wherein said two mirror portions attract or repel each other through magnetization of said magnetic layer based on said input signal such that a reflection angle of said mirror section is changed.

Specifically regarding claim 14, none of the prior art alone or in combination disclose or teach of the claimed optical path control apparatus as is disclosed above specifically wherein the said mirror section comprises: a mirror layer provided as a surface layer; a shape memory layer provided under said mirror layer, and a heating layer provided under said shape memory layer; wherein said mirror layer of said mirror section is transformed due to transformation of said shape memory layer through heating by said heating layer in response to said input signal such that a reflection angle of said mirror section is changed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sentsui et al and Oda et al (2002/0001870) are of some similar structure to the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessica T Stultz whose telephone number is (703) 305-6106. The examiner can normally be reached on M-Th 7:30-5, and alternate Fridays.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 703-308-4883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Jessica Stultz
December 23, 2002



JORDAN SCHWARTZ
PRIMARY EXAMINER